

LISTING OF THE CLAIMS

1. (Currently Amended) A tool holder for a tool which can rotate about an axis of rotation ~~(D)~~ in particular a drilling, milling, reaming or grinding tool, comprising a clamping shank which, at one end region, has a clamping formation ~~(14)~~ for securing the tool coaxially and, at its other end region has a coupling formation ~~(12)~~ for coaxial coupling to a machine tool, ~~characterized in that~~ wherein connected to the clamping shank is a bracing arrangement which, in an axial bracing section of the clamping shank, subjects the clamping shank to a bracing force with a bracing-force component acting in the axial direction, ~~it being the case that and wherein~~, in the bracing section, at least one of the ~~components~~ [[-]] clamping shank and bracing arrangement [[-]] is designed as a sleeve ~~(20)~~ which encloses the ~~respectively other component (18)~~ one of the clamping shank and bracing element coaxially.

2. (Currently Amended) The tool holder as claimed in claim 1, ~~characterized in that~~ wherein the bracing section is arranged in the axial direction between the clamping formation ~~(14)~~ and the coupling formation ~~(12)~~.

3. (Currently Amended) The tool holder as claimed in claim 2, ~~characterized in that~~ wherein the clamping formation ~~(14)~~ projects beyond the sleeve ~~(20)~~ and is designed for securing the tool with a shrink fit.

4. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 3, ~~characterized in that~~wherein the sleeve (20, 20a-f, n, l, m, o, p, s-u, z, aa) is supported on the tool holder (10) such that its ends can be pushed away from one another under tensile loading, and the clamping shank comprises a shank section (18) which connects the coupling formation (12) to the clamping formation (14) such that it can be subjected to compressive loading.

5. (Currently Amended) The tool holder as claimed in claim 4, ~~characterized in that~~wherein at its end (26), which is in the vicinity of the clamping formation (14), the sleeve (20) engages behind an annular shoulder (30) of the clamping shank, this annular shoulder being oriented away from the coupling formation (12), and at its other end (32), the sleeve is screwed to the tool holder or fixed to the tool holder in particular by a non-releasable joining method, in particular welding.

6. (Currently Amended) The tool holder as claimed in claim 5, ~~characterized in that~~wherein, at the other end (32), the sleeve (20) has a radially outwardly projecting annular collar (34) which is screwed against a radially outwardly extending annular shoulder (43) of the coupling formation (12).

7. (Currently Amended) The tool holder as claimed in claim 5, ~~characterized in that~~wherein, at the other end (32), the sleeve (20d-f) has an internal thread (44) which is screwed on to an external thread (46) of the clamping shank.

8. (Currently Amended) The tool holder as claimed in claim 4, ~~characterized in~~
~~that~~wherein, at its end (26), which is in the vicinity of the clamping formation-(14), the sleeve
(20b, c, n, s) engages behind an annular shoulder (33) of the tool holder in the region of the
clamping formation-(14), this annular shoulder being oriented away from the coupling formation
(12), or is connected integrally to the tool holder and, at its other end-(32), the sleeve is
connected integrally to the tool holder, in particular to a radially outwardly projecting annular
collar-(43) of the coupling formation-(12), and ~~in that~~wherein, in the bracing region, the
clamping shank is supported in a force-fitting and form-fitting manner on a tool holder surface
which is fixed to the coupling formation-(12).

9. (Currently Amended) The tool holder as claimed in claim 4, ~~characterized in~~
~~that~~wherein the sleeve (20s) is fixed, in particular connected integrally, both to the clamping
formation (14s) and to the coupling formation-(12s), and the region of the clamping formation is
supported on the region of the coupling formation (12s) via the shank section-(18s).

10. (Currently Amended) The tool holder as claimed in claim 9, ~~characterized in~~
~~that~~wherein the shank section (18s) is designed as a component which is separate from the
clamping formation (14s) and the coupling formation-(12s).

11. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 3, characterized in ~~that~~wherein the sleeve (~~20g, h-k, q, r, u-x, bb, cc, dd~~) is supported on the tool holder at its ends (~~26, 32~~) such that the latter can be pushed toward one another under compressive loading, and the clamping shank comprises a shank section (~~18~~) which connects the coupling formation (~~12~~) to the clamping formation (~~14~~) such that it can be subjected to tensile loading.

12. (Currently Amended) The tool holder as claimed in claim 11, characterized in ~~that~~wherein the sleeve (~~20g, h, i, q, r, w, x~~) has one of its axial ends supported on the coupling formation (~~12~~), in particular on a radially projecting annular collar (~~43~~) of the coupling formation (~~12~~), and has its other end supported on an annular shoulder of a component (~~56, 56n, 58, 80, 95~~) which can be screw-connected axially relative to the coupling formation.

13. (Currently Amended) The tool holder as claimed in claim 12, characterized in ~~that~~wherein the component is designed as a screw-connection ring (~~56~~) which is screwed on to the clamping shank.

14. (Currently Amended) The tool holder as claimed in claim 12, characterized in ~~that~~wherein the annular shoulder is integrally formed on the clamping shank (~~18h, i~~) and the clamping shank is screw-connected to the region of the coupling formation.

15. (Currently Amended) The tool holder as claimed in claim 12, ~~characterized in that~~wherein the other end of the sleeve (20e) is supported on an annular shoulder of the tool (80) which is retained in the clamping formation.

16. (Currently Amended) The tool holder as claimed in claim 12, ~~characterized in that~~wherein the annular shoulder (79r) is integrally formed on the clamping formation (14r), and the latter is fastened in an axially displaceable manner on the clamping shank (18r).

17. (Currently Amended) The tool holder as claimed in claim 11, ~~characterized in that~~wherein the sleeve (20v) has one of its axial ends supported on the coupling formation (12), in particular on a radially projecting annular collar (43) of the coupling formation (12), and has its other end supported in a frictionally fitting manner on the clamping shank (18v).

18. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 17, ~~characterized in that~~wherein the sleeve (20b, f-s, u-z, aa-ee) has an external and/or internal diameter which increases in the direction of its end which is adjacent to the coupling formation (12).

19. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 18, ~~characterized in that~~wherein the sleeve (20e) comprises a plurality of sleeve shells (67, 68) which are arranged coaxially in relation to one another.

20. (Currently Amended) The tool holder as claimed in claim 19, ~~characterized in that~~wherein the sleeve shells ~~(67, 68)~~ butt against one another at least over a part of their axial length.

21. (Currently Amended) The tool holder as claimed in claim 19 ~~or 20~~, ~~characterized in that~~wherein one of the sleeve shells ~~(67, 68)~~ is subjected to compressive loading and another of the sleeve shells ~~(67, 68)~~ is subjected to tensile loading.

22. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 ~~to 21~~, ~~characterized in that~~ wherein formed radially between the sleeve ~~(20p, aa)~~ and the shank section ~~(18)~~ is an annular space ~~(66)~~ which is filled with a material which is subjected to pressure, in particular with a free-flowing material or a plastically deformable or elastic material.

23. (Currently Amended) The tool holder as claimed in claim 22, ~~characterized in that~~wherein the axial ends of the sleeve ~~(20p, aa)~~ are connected in a tension-resistant and sealed manner to the tool holder ~~(10)~~, in particular are friction-welded thereto, and ~~in that~~wherein the sleeve ~~(20)~~ encloses the clamping shank ~~(18)~~ with radial spacing and, in order to produce axial tensile bracing of the sleeve ~~(20)~~, material which is subjected to pressure, in particular elastic material is introduced between the clamping shank ~~(18)~~ and the sleeve ~~(20)~~.

24. (Currently Amended) The tool holder as claimed in claim 22 ~~or 23~~, ~~characterized in that~~wherein pressure-changing means (76) are provided ~~and can be used to change~~for changing the pressure of the material in the annular space (66).

25. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 ~~to 24~~, ~~characterized in that~~wherein the clamping shank section (18) ~~or the sleeve (20) [-]~~ insofar as ~~this component~~it is subjected to compressive loading, ~~[-]~~ is supported axially via a damping element (59) ~~relative to the other component of the clamping shank and bracing arrangement,~~ which is subjected to tensile loading.

26. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 ~~to 25~~, ~~characterized in that~~wherein at least over part of its axial length, the sleeve (20 ~~v-z, bb~~) butts in a frictionally fitting manner against the circumference of the clamping shank (18).

27. (Currently Amended) The tool holder as claimed in claim 26, ~~characterized in that~~wherein the sleeve (20 ~~v-z, bb~~) has its two ends supported in an axially prestressed manner on the tool holder (10), that end of the sleeve (20) which is axially in the vicinity of the clamping formation (14) being retained on the clamping shank (18) such that it is fixed axially in a frictionally fitting manner, with press-fit action, in a friction-fit section (89).

28. (Currently Amended) The tool holder as claimed in claim 26 ~~or 27~~, ~~characterized in that~~wherein the sleeve (20~~v-z, bb~~) and the clamping shank, (18~~v~~) adapted to one another at least over part of the friction-fit section (89), are of slightly conical form.

29. (Currently Amended) The tool holder as claimed in ~~one of claims~~ claim 26 ~~to 28~~, ~~characterized in that~~wherein the sleeve (20~~v-x, bb~~) is supported on the tool holder (10) such that it is prestressed axially under compressive loading, and it encloses the clamping shank (18) with radial spacing in the axial direction between the friction-fit section (89) and the end which is directed axially toward the coupling formation (12) and is supported on the tool holder (10).

30. (Currently Amended) The tool holder as claimed in claim 29, ~~characterized in that~~wherein in the axial direction between the friction-fit section (89) and the other end, which is supported on the tool holder (10~~v~~), at least one damping ring (94) made of an elastically compressible material is arranged between the circumference of the clamping shank (18) and the inner lateral surface of the sleeve (20~~v~~).

31. (Currently Amended) The tool holder as claimed in ~~one of claims~~ claim 1 ~~to 30~~, ~~characterized in that~~wherein the clamping shank (18) merges into an annular shoulder (41) of the coupling formation (12) and the sleeve (20) is supported axially on the annular shoulder (41), and ~~in that~~ wherein at least the end (32) of the sleeve (20~~b, c, f-s, v-z, aa-dd~~), ~~this~~such end being supported on the annular shoulder (41), is designed as a conical section which tapers axially away from the annular shoulder (41).

32. (Currently Amended) The tool holder as claimed in claim 31, ~~characterized in that~~wherein the conical section covers over at least one damping ring ~~(94)~~.

33. (Currently Amended) The tool holder as claimed in claim 31 ~~or 32~~, ~~characterized in that~~wherein the sleeve is prestressed axially under compressive loading.

34. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 ~~to 33~~, ~~characterized in that~~wherein the sleeve ~~(20x)~~ comprises an axially resilient zigzag-spring section ~~(97)~~.

35. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 ~~to 34~~, ~~characterized in that~~wherein the sleeve ~~(20bb)~~ has its two ends supported axially on the tool holder ~~(10)~~, there being arranged in the supporting path of one of the two ends of the sleeve ~~(20bb)~~ a supporting device ~~(100)~~ which can be moved axially relative to the tool holder ~~(10)~~ and has at least one supporting piston ~~(103)~~, which is guided in an axially displaceable manner in an associated pressure chamber ~~(102)~~ which contains a free-flowing or plastically deformable pressure medium ~~(101)~~, the pressure chamber ~~(102)~~ being assigned an adjusting element ~~(104)~~ for changing the pressure in the pressure medium ~~(102)~~.

36. (Currently Amended) The tool holder as claimed in claim 35, ~~characterized in that~~wherein the supporting piston ~~(103)~~ is designed as an annular piston which can be displaced

axially in an annular space forming a pressure chamber (102) and on which one of the two ends of the sleeve (20bb) is supported or to which this end is connected.

37. (Currently Amended) The tool holder as claimed in claim 35 or 36, characterized in ~~that~~wherein the adjusting element (104) is a piston screw which acts on the pressure medium (101).

38. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 35 to 37, characterized in ~~that~~wherein the other of the two ends of the sleeve (20bb) is fixed to the clamping shank (18), or is supported axially on an annular collar of the clamping shank (18), in particular on a securing ring (95bb) which is retained in a releasable manner on the clamping shank (18).

39. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 38, characterized in ~~that~~wherein at least over part of its axial length, the sleeve (20ee) encloses the shank section (18) with radial spacing to form an annular space (111), and arranged in a radially prestressed manner in the annular space (111) is an annular damping element (112) which is in surface abutment against the inner circumferential surface (113) of the sleeve and the outer circumferential surface (29ee) of the shank section (18ee).

40. (Currently Amended) The tool holder as claimed in claim 39, ~~characterized in~~
~~that~~wherein the damping element (112) consists of elastically compressible material, and ~~in~~
~~that~~wherein the annular space (111) is bounded axially by annular shoulders (115, 117), between
which the damping element (112) is braced axially in order to produce radial prestressing.

41. (Currently Amended) The tool holder as claimed in claim 40, ~~characterized in~~
~~that~~wherein one of the annular shoulders (117~~dd~~) can be displaced axially in order to change the
prestressing of the damping element (112).

42. (Currently Amended) The tool holder as claimed in claim 41, ~~characterized in~~
~~that~~wherein the axially displaceable annular shoulder (117~~dd~~) is formed by an axially
displaceable screw-connection arrangement (119) which is retained on the coupling formation
(12~~dd~~).

43. (Currently Amended) The tool holder as claimed in ~~claims~~claim 39 to 42,
~~characterized in that~~wherein the annular space (111) is conical.

44. (Currently Amended) The tool holder as claimed in claim 43, ~~characterized in~~
~~that~~wherein the damping element (112) is prestressed in the direction of the tapering of the
conical annular space (111).

45. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 44, ~~characterized in that,~~wherein at least over part of its axial length, the sleeve (20~~m, n, o~~) encloses the shank section (18)-with radial spacing to form an annular space, and ~~in that~~wherein an absorption-mass body (65~~m, n, o~~) is arranged on the shank section (18) in the annular space.

46. (Currently Amended) The tool holder as claimed in claim 45, ~~characterized in that~~wherein the absorption-mass body (65~~m, n, o~~) can be displaced along the shank section (18).

47. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 46, ~~characterized in that~~wherein the two components [[-]] clamping shank and bracing arrangement [[-]] consist of different materials.

48. (Currently Amended) The tool holder as claimed in claim 47, ~~characterized in that~~wherein one of the components clamping shank and bracing arrangement, in particular the one designed as the sleeve (20), at least in its region which transmits the axial bracing force, consists of hard metal or heavy metal or a metal matrix composite material or ceramic or plastic, in particular glass-fiber-reinforced or carbon-fiber-reinforced plastic.

49. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 1 to 48, ~~characterized in that~~wherein one of the ~~two components~~ clamping shank and bracing arrangement ~~[[-]]~~ is supported on the other of the ~~two components~~clamping shank and bracing arrangement via at least one joint (~~22, 22a, h, i, q, r, s, v - z, aa - gg, 24, 24a - i, n, q, r, v - z, aa - gg~~) which transmits the axial bracing force.

50. (Currently Amended) The tool holder as claimed in claim 49, ~~characterized in that~~wherein the joint (~~24v - z, bb~~) is provided between two circumferential surfaces of the two components which butt against one another with radial press-fit action.

51. (Currently Amended) The tool holder as claimed in claim 49 or 50, ~~characterized in that~~wherein the joint (~~22, 22a, h, i, q, r, s, v - z, aa - dd, 24, 24a - i, n, q, r, w - z, aa - gg~~) is provided between two axially abutting surfaces of the ~~two components~~ clamping shank and bracing arrangement.

52. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 49 to 51, ~~characterized in that~~wherein a damping-material layer (~~59; 59t~~) is arranged between the two joint-forming surfaces.

53. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 49 to 52, characterized in ~~that~~wherein at least one of the two axial ends of the sleeve-forming component one of the clamping shank and bracing arrangement forms one of the abutting surfaces of the joint, and a circumferential surface (120) is integrally formed, or fitted, on the other of the ~~two components~~ clamping shank and bracing arrangement and centers the sleeve radially in the region of this end.

54. (Currently Amended) The tool holder as claimed in claim 53, characterized in ~~that~~wherein the joint-forming surfaces are provided in each case at the two ends of the sleeve, and the sleeve is centered radially in the region of the two ends by circumferential surfaces of the other component of the clamping shank and bracing arrangement.

55. (Currently Amended) The tool holder as claimed in claim 53 or 54, characterized in ~~that~~wherein the circumferential surface of the other component of the clamping shank and bracing arrangement butts with radial press-fit action against a circumferential surface of the sleeve.

56. (Currently Amended) The tool holder as claimed in ~~one of claims~~claim 53 to 55, characterized in ~~that~~wherein the circumferential surface of the other component of the clamping shank and bracing arrangement encloses the sleeve in a radially outward direction in the region of at least one of its axial ends.

57. (Currently Amended) The tool holder as claimed in claim 56, ~~characterized in~~
~~that~~wherein at least that end of the sleeve which is adjacent to the clamping formation is
enclosed in the radially outward direction by the circumferential surface of the other
~~component~~of the clamping shank and bracing arrangement.

58. (Currently Amended) The tool holder as claimed in claim 56 ~~or 57~~, ~~characterized in~~
~~that~~wherein that circumferential surface of the other of the ~~two components~~ clamping shank and
bracing arrangement which encloses the sleeve ~~(20ff)~~ in the radially outward direction in the
region of at least one of its ends, in particular in the region of its end ~~(26ff)~~, which is adjacent to
the clamping formation ~~(14ff)~~, is formed by a ring ~~(119ff)~~ which covers over the joint axially and
also encloses the other ~~component~~ of the clamping shank and bracing arrangement in the radially
outward direction.